REMARKS

Claims 1 – 32 are pending. Claims 1, 3, 5, 8 and 29 are currently amended, and claim 32 is new. As discussed below, the claims are in condition for allowance.

Provisional Rejection of Claim 20 Under Double Patenting Obvious-Type

This provisional rejection of claim 20 is noted and applicants request deferral of the matter until the action is made un-provisional in accordance with MPEP §822. At that time applicants will submit arguments regarding the propriety of the rejection or take other action such as filing a terminal disclaimer.

Claims 1, 2, 8-13 and 29-31 are rejected under §102(b) as being anticipated by Tuttle et al. (5,796,535)

As discussed below, the Applicants' attorney respectfully disagrees with this rejection.

Claims 1 and 2 recite a storage disk comprising a disk sector having a beginning and operable to store data; and a servo wedge located at the beginning of the sector and operable without a zero frequency field to indentify the sector in conjunction with an initial positioning of a read-write head and a read of the data from or write of the data to the disk sector.

Tuttle el al. '535 discloses a disk servo system that uses a spin-up dc erase wedge field to mark the servo data wedge location and thereafter the servo wedge and wedge sector data are read. Referring for example to Col. 15, lines 30-41, Tuttle et al. cannot locate the servo wedge during "initial positioning of a read-write head—" without first detecting a predetermined seqence of disk recorded bits "normally a long sequence of "0" bits". Such a "0" bit sequence is also known in the art as a dc erase field or sometimes called a transitionless or zero-frequency field. It is used on spin-up because a transitionless field will not be confused with any user or servo data or other control field having alternating magnetic patterns. See Leis et al US 5,036,408 also

cited by the Examiner and discussed below. Therefore Tuttle el al. '535 does not disclose a "servo wedge" that identifies a sector in an "initial positioning" rather Tuttle et al. initially identifies a dc erase field and then subsequently recovers servo data that has the wedge and track indentification.

In contrast to the Tuttle et al. '535 disclosure which initially determines the head circumferential position by first finding the dc erase field, applicant for example discloses a servo circuit 30 of Fig 5 that initially detects the presence of a first servo wedge by a positive detection of the synchronizing preamble of such servo wedge (Paragraphs 35-36) using the clock sampling and summing process of a sinusoidal wave read from the preamble non-zero-frequency bit sequence shown in Figure 7 (Paragraphs 37-39). The direct detection of the servo wedge allows the storage disk to have no or few transitionless dc erase spin-up fields that if present take up disk storage space. This aspect is reflected in claims 1 and 2 above and they are not anticipated by Tuttle et al. '535.

Claims 8-13 as amended

Each of these claims recite a storage disk having servo wedges that include substantially identical "other portions having non zero-frequency bit patterns" not including the sector track location identifiers and position bursts, wherein the "other portions ---(are)---- detectable during an initial read-write head positioning".

For the reasons given above for claims 1 and 2, Tuttle et al. '535 does not disclose the detection of any portion of the servo wedge having bit patterns without first locating the long sequence of "0" bits also known as a dc erase field.

Claims 29-31

Each of these claims recite a servo wedge for identifying the disk sector without a zero-frequency field in conjunction with initial positioning and are not anticipated by Tuttle et al. '535 for the reasons above stated in regard to claims 1 and 2.

Claims 14 and 20 are Rejected under § 103(a) as Unpatentable over Sacks et al. (US 6,181,505) in view of Tuttle el al. (US 6,108,151)

As discussed below, the Applicant's attorney respectfully disagrees with this rejection.

Claim 14 recites in combination with components of a disk drive system
"---servo wedges that each include respective servo data that identifies the location of
a respective data sector;--" and
"--servo circuit including,
a servo channel operable to recover the servo data from the read signal, and
a processor coupled to the servo channel and operable to detect one of the
servo wedges while or after the disk attains an operating speed but before
the servo channel recovers servo data from any other of the servo
wedges----".

Sacks et al. '505 discloses a controller 102 for producing a tracking or position error (PES) during read-write. See for example Col. 4, lines 37-43, and Col. 7, lines 8-25. There is no disclosure of how Sacks et al. finds sector and track location initially such as on spin-up. Sacks et al does disclose that "leading" and "middle" fields 320, 322 and 324 of Fig 3 contain sync, phase, track and sector numbers. The teaching in Sacks et al. is primarily concerned with the radial tracking error (PES) using offset bursts of position error field 126 for head position correction during normal read write operations after spin-up and is silient as to the initial finding of a sector wedge having servo data.

Tuttle et al. '151 which has the essential same disclosure as Tuttle et al. '353 discussed above does disclose initial positioning using a sequence of "0" bits, sometimes called a dc erase field (see above with respect to the discussion of claim 1) detected during spin-up to initially find a sector wedge. Tuttle el al. '151 also discloses radial tracking bursts of a servo control described for example beginning at Col. 15, line

64 through Col. 16 and continuing and is comparable in this respect to Sacks et al. Tuttle et al '151 does not teach the initial detection of a sychronizing preamble such as in a sector wedge but rather uses the "0" bit field, also known as the dc erase field to cause acontrol signal A118 to start acquistion of preamble 5 (Fig. 2B) during an initial head positioning, such as during spin-up. See Col. 15, lines 26-30; Col. 9, lines 29-36; and Col. 11, lines 15-19.

Therefore, neither Tuttle et al. '151 or Sacks et al. disclose a "--processor coupled to the servo channel and operable to detect one of the servo wedges while or after the disk attains an operating speed but before the servo channel recovers servo data from any other of the servo wedges----". The additional disclosure of Sacks et al. does not teach or suggest modifcation of Tuttle et al. in a way that would result in the system of claim 14.

Claim 20 recites a disk drive system comprising elements including "a data-storage disk having a surface, a data sector at a location of the surface, and a servo wedge including servo data that identifies the location of the data sector;" ---- and----- "a processor coupled to the servo channel and operable to detect the servo wedge while or after the disk attains an operating speed but before the servo channel recovers any servo data". Claim 20 is patentable for at least the reasons given above in support of claim 14.

Claims 15-19 and 21-24 are rejected as being unpatentable under §103(b) over Tuttle et al. and Sacks et al. in further view of Leis et al. (US 5,036,408)

As discussed below, the Applicant's attorney respectfully disagrees with this rejection.

Claims 15-19 and 21-24 are submitted as patentable for the reasons above in support of claims 14 and 20 and for the further reasons.

Leis et al. discloses for example in the Abstract and in Fig. 2 and the related text in Col. 6, beginning on line 24 through line 68 that the sector wedge cannot be initially found without first locating the dc erase field, that is a transitionless disk field (Col. 4, lines 48-52; Col. 6, lines 24-32). In this respect Leis et al is representative of the usual spin-up control for many current disk storage systems as discussed in Applicants statement of the "Background of the Invention" beginning at Paragraph 2. Therefore Leis et al. does not add any additional teaching to Tuttle et al. and Sacks et al. that would support the rejection of patentability of claims 15-16 and 21-24.

Claims 3-6, 25, 26 and 27 are rejected as unpatentable over Tuttle et al. '151 in view of Ottesen et al. (US 6,560,054)

As discussed below, the Applicant's attorney respectfully disagrees with this rejection.

Claim 3 as amended recites "a storage disk, comprising data sectors; servo wedges each detectable by a read head upon initial spin-up and identifying a respective data sector; and no spin-up wedges."

As discussed above and as the Examiner has noted Tuttle el al. '151 has spin-up wedges, that is dc erase or transitionless disk fields needed for intially locating servo wedges during spin-up.

Ottesen et al. discloses a fundamentally different type of disk control system in which a angular position of the storage disk is indexed to a pattern of spikes in the spindle motor voltage. It is disclosed that this spindle and hence disk angular position may be used to locate the disk position without first "loading" the transducer heads onto the disk. Col. 6, lines 51-56. It is further stated that the spindle motor index is "matched up with the nearest neighbor servo sector index" to "establish absolute rotary position". Col. 6, lines 57-65.

Ottesen et al teaches against, that is away from using its approach in combination with a Tuttle et al system that reads sector wedge data after spin-up for

example because such operation in Tuttle et al. requires loading the read-write head onto the disk. See Ottesen et al. Col. 2, lines 23-40. Furthermore, in Ottesen et al. there is no mention of the presence or absence of dc erase or transitionless spin-up wedges and therefore these references taken together do not suggest a modification of Tuttle et al.'s spin-up wedges on the Tuttle et al. storage disk. The Ottesen et al. and Tuttle et al. approaches to the initial locating of sector data go in such separate directions that at most the combination would, if attempted result in a Tuttle et al disk with spin-up wedges that are sensed by Tuttle et al transducers and an additional angular disk indexing for the conditions taught by Ottesen et al such as when the heads are not yet in postion to read, ie. unloaded, from the disk and hence claim 3 in not rendered unpatentable by the combined teachings of Ottesen et al and Tuttle et al.

Claims 4 , 5, 6, 25 and 26 are submitted as patentable for at least the reasons given above in support of claim 3.

Claim 27 recites the method of claim 25 wherein writing the servo wedges comprises writing the servo wedge in a track of the disk sector, the servo data operable to identify the track during an initial positioning of the head and during a read of file data from or write of file data to the track.

Ottesen et al does not teach or suggest that "the servo data (read from the track) is operable to identify the track during an initial positioning of the head". The initial angular positioning in Ottesen et al. is derived from the motor commutator signal spikes. Therefore even if one attempted modification of Tuttle et al. in view of the Ottesen et al disclosure, such would not result in the method of claim 27.

Claims 7 and 28 are rejected under §103(a) as being unpatentable over Tuttle et al. and Ottesen et al in further view of Ehrlich et al (US 6,519,107)

As discussed below, the Applicant's attorney respectfully disagrees with this rejection.

Claim 7 recites "the storage disk of claim 5 wherein the pre-synchronization-mark sections of the servo wedges lack erase fields". Claim 28 is similar as a method depending on claim 27.

Tuttle et al. and Ottesen et al. are discussed above and it is repeated that the rejection of these claims is not supported for the reasons given above in regard to claims 3, 5 and 25.

Ehrlich et al. discloses a storage drive system for first servo writing reference burst patterns on a disk under clean room conditions and then self-writing additional patterns on the same disk using the reference patterns as masters, in order to improve manufacturing efficiency. There is no statement in Ehrlich et al. that the servo patterns lack spin-up wedges, that is erase fields. The teaching is primarily of servo writing burst patterns used for centering the read-write heads on the circumferential tracks and sequentially self writing these and additional patterns to speed up disk manufacturing. Ehrlich et al. does disclose that "phase coherent servo fields including track number information may also be included within the reference servo patterns and the final product servo patterns". Col. 6 lines 65-67; Col. 12, lines 18-21, 50-51; and Col. 14, lines 37-54. For example, in Col. 14, beginning at line 38 Ehrlich et al states that the digital servo information 23 includes for example a sync field, a servo address mark field which may include a once per revolution fiducial location, a track number field and a servo number field. There is no statement of either the presence or elimination of a dc or transitionless field for spin-up. Because Ehrlich et al. is primary concerned with the tracking servo bursts 22, it is fair to conclude that the various fields of Ehrlich et al. information 23 may include the usual a dc or transitionless field. Indeed many of the systems of this art area cited in the file: e.g. Tuttle et al., Leis et al., and Patapoutian et al. (US 5,661,760) expressly disclose the use of it.

The Office Action cites Ehrich et al. Col. 14, lines 20-33 as support for the assertion that their system has no erase field for finding a servo wedge. However lines 20-23 simply state that "—no attempt is made to DC erase the burst edges in order to

trim or adjust burst widths ---" as apparently Ehrlich et al. found the "untrimmed" servo bursts are preferred for tracking. This particular aspect of Ehrlich et al. has no bearing on the teaching and claims of Applicants for an alternative spin-up without the usual dc erase field. Whether trimmed or "untrimmed" the bursts of Ehrlich et al. are not used for initially locating sector and track identifications and the use of the words DC erase in the context of Col. 14, line 23 in Ehrlich et al is a superficial coincidence. DC erase in such context referring to the untrimmed tracking bursts does not suggest Applicant's claim of an omitted, or lack of a spin-up dc erase and therefore claims 7 and 28 are patentable over the teachings of Tuttle et al., Ettesen et al. and Erlich et al.

CONCLUSION

In light of the foregoing, claims 1-32, including amended claims 1, 3, 5, 8, and 29, are in condition for full allowance, and that action is respectfully requested.

In the event additional fees are due as a result of this amendment, you are hereby authorized to charge such payment to Deposit Account No. 07-1897.

If the Examiner believes that a phone interview would be helpful, then it is respectfully requested that Applicants' attorney, Bryan Santarelli be contacted at (425) 455-5575.

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Respectfully submitted,

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